Increasing Robotic Science Applications

Completed Technology Project (2011 - 2012)

Project Introduction

The principal objectives are to demonstrate robotic-based scientific investigations and resource prospecting, and develop and demonstrate modular science instrument hardware. Use of mobile science platforms will provide a determination of the chemical and mineralogical composition and surface mapping of the site. The R2 Robonaut-deployed modular Mobile Science Toolbox (MST) will deploy a MIMOS instrument (or other TBD instrument) to determine surface composition. The C2 rover-Towed Instrument Platform (TIP) will initially employ functional low fidelity instruments including a GPS locator and altimeter (simulating orbiting position satellites), digital camera, magnetometer, soil moisture sensor, 3-axis accelerometers, high fidelity surface acoustic wave (SAW) RFID temperature sensors and, potentially, a ground penetrating radar. Develop first-generation modular science platforms that can be evolved into robotic precursor missions to NEOs, Moon, Mars moons and Mars. Develop, demonstrate and gain experience in robotic science operational concepts

The project consists of the design, fabrication and testing of two science platforms. The first is a portable Robonaut-compatible science "toolbox" that will function as a self-contained, first generation modular science system. The second is a larger robot-towed six-wheeled platform that will also demonstrate remote-controlled robotic science. Both of these systems will function as science pre-cursors allowing a large amount of area to be investigated prior to crew arrival and allowing more optimized human exploration time. In addition, both platforms will be evolved in later generations to provide modular, self-contained science platforms that can fly actual science missions to the Moon, Mars, and NEOs.

Anticipated Benefits

N/A

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Center Innovation Fund: JSC CIF

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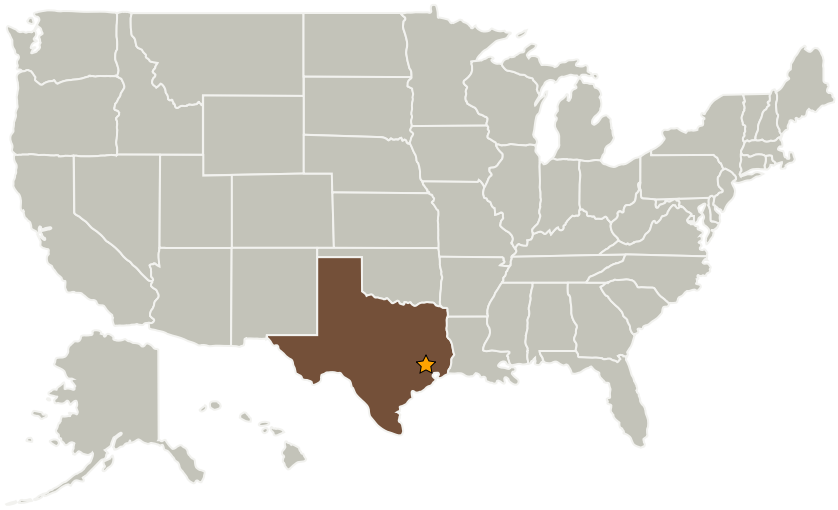
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations
Texas

Project Management

Program Director:
Michael R Lapointe

Program Manager:
Carlos H Westhelle

Project Manager:
Lee D Graham

Principal Investigator:
Lee D Graham

Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.2 Mobility
    - TX04.2.4 Surface Mobility